

11-13-00

UTILITY PATENT APPLICATION TRANSMITTAL
(Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
DE919990084US1

Total Pages in this Submission

TO THE ASSISTANT COMMISSIONER FOR PATENTSBox Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

Currency and Float ID Tracking in an Electronic Purse.

and invented by:

H. Droege et al

If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Which is a:

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 12 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal Number of Sheets 2
- b. ☐ Informal Number of Sheets _____
4. ☒ Oath or Declaration
- a. ☒ Newly executed *(original or copy)* ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied
under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy *(identical to computer copy)*
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class ☒ Express Mail *(Specify Label No.):* EK830786517US

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Accompanying Application Parts (Continued)

15. ☒ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

16. ☐ Additional Enclosures *(please identify below):*

Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)

17. ☐ Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

Warning

An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.

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Fee Calculation and Transmittal

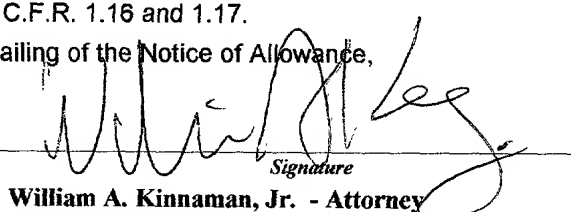
CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	7	- 20 =	0	x \$18.00	\$0.00
Indep. Claims	1	- 3 =	0	x \$80.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$710.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$710.00

- ☐ A check in the amount of _____ to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 09-0463 as described below. A duplicate copy of this sheet is enclosed.
- ☒ Charge the amount of \$710.00 as filing fee.
 - ☒ Credit any overpayment.
 - ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
 - ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: November 09, 2000

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Docket Number: DE919990084US1

Inventor: H. Droege et al

Title: Currency and Float ID Tracking
in an Electronic Purse

APPLICATION FOR UNITED STATES
LETTERS PATENT

"Express Mail" Mailing Label No.: EK830786517US
Date of Deposit: November 9, 2000

I hereby certify that this paper is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Box Patent Application, Assistant Commissioner for Patents, Washington, DC 20231.

Name: Karen L. Merrigan

Signature: Karen L. Merrigan

INTERNATIONAL BUSINESS MACHINES CORPORATION

CURRENCY AND FLOAT ID TRACKING IN AN ELECTRONIC PURSE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to electronic purse systems, and in particular it relates to the improved management of multiple money flows in such systems.

2. Description of the Related Art

Electronic purse systems exist in multiple implementations and are usually targeted at one particular group of customers.

An example is the electronic purse system operated by the German Zentraler Kreditausschuss (ZKA) which handles the management of eurocheque cards, so-called ec-cards, issued for actuating electronic money transfers intended by the owners of ec-cards, the respective card holders in Germany.

The implementations which are known can, however, usually accommodate only one currency at a time, or they can only accept payments from one user group and do not have the capability to differentiate between more than one user group when using only one system key. Examples for such a desired differentiation are, however, patrons as service buyers at a company cafeteria which is open to employees of the company but also to contractors, to employees of a neighbor establishment, visitors from other companies, or other eligible groups.

It is important that, when the card holder comes to a service provider and makes a purchase, the service provider is reimbursed for his services from the money which the card holder has paid

when he had loaded his electronic purse. The path this money takes through the system is a money flow.

Purses known so far do not have the feature to support more than one money flow with one system key only. They are understood to work with one currency and for one user group only.

For terminology purposes, "purse" described here is understood to be a money management component which is configured to work with one currency at a time. The surrounding system however can accept a multitude of such "purses" configured to different currencies.

If card holders can load their purses in one place and spend it in another place, or if there are different card holder groups, then the necessity can arise that these money flows shall be kept separate. The purse provider is the hub who receives load transaction records and money from the load stations, keeps these money flows in a multitude of accounts, and distributes the money from these accounts to service providers upon receipt of a purchase transaction record. If there is more than one environment -- where the term "environment" should be understood for the purposes of the present invention as a synonym for user group -- in which cards can be loaded, and/or more than one environment in which the money can be spent for purchases, then the purse provider has to keep as many accounts as there are environments or user groups, respectively. Each such an account in prior art technique is associated with the task of maintaining a system key.

Money flows into an account or out from an account must be traceable to the respective environment in which the load and purchase transactions have taken place. The purse system provider therefore has a business interest to keep these money flows separate and track them separately mainly because of billing purposes associated with the concerned service provider(s).

The service providers themselves may also want to differentiate between different groups of buyers simply for identification purposes. Different prices based on a certain subsidy for the

employees which is not granted to foreign persons may for instance be a reason to identify user groups separately. Other reasons exist dependent of the respective field of application.

User group separation can also be accomplished -- and has been in the past -- with different system keys for each group. Such a differentiation by keys introduces a prohibitively involved key management, including a corresponding number of secure access modules (SAMs), which are installed in each load and pay stations in order to perform a secure processing of any load and purchase transaction and which thus have to be present in any load stations and purchase stations contained in the system.

The handling of more than one system key, however, is difficult as each system key has to be kept strictly secret and must be hidden from service persons occupied with servicing the transaction processes and the services necessary to operate the plurality of SAMs. In any case, the generation and the distribution of such a system key has to be kept secure. Thus, even checking if a system key stored in a SAM is correct is a task which is difficult to perform, as it is not readable there out of reasons of security. The more different system keys a purse system uses, the lesser comfortable is its management.

SUMMARY OF THE INVENTION

It is thus an object of the present invention to provide a method in an electronic purse system which is adapted to manage a plurality of user groups without maintaining a respective plurality of system keys each associated with a respective user group in prior art.

The method and system as claimed in the independent claims solve this problem. Advantageous embodiments thereof reveal from respective subclaims.

According to the basic principles of the present invention it is proposed that the secure access modules (SAMs) of a purse provider need to hold only one system key and that user groups or

environments which can be supported by the system are identified by a so-called float ID tag which is advantageously added to each set of data involved in a load or purchase process performed by the user of the electronic purse system.

5 As a matter of fact, this float ID tag introduces new features characterizing the user group into each set of data associated with a load or a purchase process. Such a new feature does not need to be treated as strictly secret as it is necessary with the system key. It may still need to be adequately protected against fraudulent modifications. This way, an adequate means for managing more than one user group or environments is found which does not imply any
10 involvement of the protected system key.

As an advantage of this basic approach of the present invention, purses which have been loaded in a given environment can be used to purchase goods at an environment located elsewhere, as for example it is the case when the purse provider operates a system at company A and another
15 system at company B.

Then, a card which has been loaded with "electronic money" at company A (environment A) can be used to buy services at company B (environment B). The money flows are continually traceable, from the moment the purse is loaded at place A, up to the moment when a purchase is
20 made at another establishment in B, until the service provider in place B receives money from the account A which belongs to the load station in environment A.

By aid of said tag field identifying the specific environment or the user group each money flow can easily traced through the system. The system has become essentially more flexible compared
25 to prior art while having just one system key.

According to a second aspect of the present invention a second tag field can be added as described above: a currency indicating tag.

The system according to this additional feature of the present invention has the advantage that it accommodates multitude of purses with different currencies, for instance purses for German marks or purses for euros, or purses for US dollars, etc.

5 In addition, it accepts a multitude of combinations of a currency and a user group, for instance a purse from an own employee in German marks, a purse from a contractor in euros, a purse with US dollars from a neighbor company, francs from a visitor, etc. The SAMs always contain the same set of keys since they belong to one purse provider but they still accommodate a multitude of currencies and environments/user groups.

10 In this case each electronic purse is tagged with a parameter pair which indicates the currency and the user group to which the owner belongs. These tags can be changed under control of the purse provider if the purse provider decides to allow this feature, for instance to allow a switch of the currency for a purse.

15 BRIEF DESCRIPTION OF THE DRAWINGS

20 An embodiment of the method of the present invention will be exemplarily described in more detail in conjunction with the drawings in which:

Fig. 1 is a schematic sketch of a data set generated in both of the above cases of loading and purchasing;

25 Fig. 2 is a schematic block diagram showing the control flow during a process according to the method of the present invention in which a card used in the system is loaded; and

Fig. 3 is a schematic block diagram showing the control flow during a process according to the method of the present invention in which a purchase is undertaken with said card described in Fig. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With general reference to the figures and with special reference to Fig. 1 the basic structure of a data set 10 generated during a preferred embodiment of the method of the present invention will be described as follows.

The electronic purse system is installed in a cafeteria which can be visited by the staff of two companies A and B concurrently, as well as by visitors to the companies. Staff members and visitors each have a chip card for use in this electronic purse system. The system requires only one system key which is valid for all three different user groups.

The first field contained in the data set is the currency field 12. In here an ID is stored which is unique for each of the currencies supported by the electronic purse system according to the present invention.

The next field is the field 14 containing the float ID. In the exemplary embodiment three different float IDs are required for identifying each of the three accepted user groups mentioned above.

In the next field 16 the load or purchase amount in a transaction is stored. Among other fields, a balance field is optional.

Field 18 depicts the purse ID. By that field an individual purse is identified by the system. It can be used for error recovery.

Fields 20, 22 contain date and time associated with different processes as purchases or load processes effectuated by a user.

In the portion depicted by 24 other fields are provided which need not to be mentioned for sake of clarity.

Next, and with additional reference to Fig. 2 a typical card loading process in the purse system of the present invention will be described in more detail.

A user, assumed as a staff member of company A wants to load his card. To do this, he puts it into the slot of a card loading terminal installed in a building of company A, step 110.

First, in analogy to prior art authentication methods, the secure access module (SAM) and the purse verify the correctness of the system key. One component calculates a message authentication code (MAC) using the system key, step 120. The other component verifies the MAC and therewith data correctness and key equality, step 130. If the purse key does not match the one in the SAM, which might be the case when the user puts in some different card, the card is rejected from further processing, step 140.

Otherwise, the SAM reads the float ID in order to know about the user group the user is associated with, step 150. The float ID is checked whether it is supported in the SAM what yields a decision, step 160. If the float ID is not maintained in the purse system, maybe because the user is staff member of a company C having the same purse system with the same system key but without a permission to use the load terminal, the card is restricted from further processing as well, step 140.

Otherwise, step 170, the SAM reads the currency indicator from the purse e.g., euros, US dollars, or German marks.

The SAM checks if the indicated currency of the purse is supported in the SAM and rejects the purse if this is not the case, steps 180, 140. A purse card can only be loaded with the currency which is indicated in its currency field.

Then, the flow of events where the purse is loaded is analogous to prior art, step 190.

Then, in a step 200 the program residing in the SAM generates a transaction data set as depicted in Fig. 1. In particular, the fields containing the float ID, currency and the transaction amount as well as the purse ID are stored in the data set. Optionally accumulated data sets which include the float ID, currency, and the accumulated transaction amounts of more than one transaction can be used to account for the total money turnover at a service station. This saves communication overhead.

Then, in a step 210 the data set is sent to the purse provider.

Further, in step 220 the purse balance is updated, where the load amount is added to the amount which was present on the card before loading it. Then, the loading procedure has completed and the card is ejected to the user, step 230.

According to the present invention, the flow of the cash can now be traced throughout the purse system with the help of the data records as mentioned above. The users can be treated separately according to their respective user group.

With reference to Fig. 3 a typical purchase is described in more detail which is effectuated by the same user in the cafeteria using a respective purchase terminal of the electronic purse system.

The user chooses some coffee and some cake for three colleagues and himself. For paying it he inserts his card into the card reader present at the purchase terminal, step 310.

Then, preferably, steps 310 to 380 are performed in the same way as described in steps 120 to 180 with reference to Fig. 2. A detailed description for this sequence of steps can thus be omitted.

Then, in the YES-branch of step 380 the regular price for the purchase is input by the staff of the cafeteria and is read by the system from a respective input buffer, step 390.

5 Then, in a step 400, the purse currency and float ID and thus the user group associated with the purse holder from company A is evaluated by the system. It is assumed now that for staff from company A a price reduction of 20% relative to the regular prices is granted as respective subsidies from company A are given to its staff members. A purse with an unsupported currency or float ID is rejected.

10 Thus, in step 410, the reduced price is calculated as 80% of the regular price.

Then, steps 420 to 450 are performed as described in steps 200 to 230 of Fig. 2. In particular, the data set generated contains again the purse's float ID and currency.

15 Thus, the purchase procedure has completed and the data set containing the float ID enables the purse provider to trace the cash flow separated in respective user groups.

20 In addition, when staff of company B is granted only a price reduction of 10%, the reduced price is easily calculated as the reduction is coupled to the float ID and thus to the user group of company B. For a visitor the price reduction would be 0%, i.e., the regular price would have to be paid

25 It is obvious that the general concept comprised of the present invention can be subjected to form various modifications not described explicitly in the foregoing description. In particular, a purse provider can provide a complex purse system having in total a plurality of system keys, the SAMs being spread over a large geographic zone and having locally concentrated purses with a single system key and multiple float IDs as described before.

Further, the aspects of the present invention can be combined as suited and required by the actual requirements. For example, the same float ID could be used in different purses with different system keys.

5 The present invention can be realized in hardware, software, or a combination of hardware and software. A typical combination of hardware and software could be a terminal with a SAM or any other software running on the SAM in more or less close interaction with a piece of software implemented in the user's card or associated to it, that, when being executed, controls the SAM or a program stored on the card such that it carries out the methods described herein. The present
10 invention can also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described in order to carry out the method of the present invention in whole or in part. Computer program means or computer program in the present context mean any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular
15 function either directly or after either or both of the following a) conversion to another language, code or notation; b) reproduction in a different material form.

What is claimed is:

CLAIMS

1. A method for operating an electronic purse system that is provided with a system key to protect transactions and to verify that a secure access module (SAM) and a purse card belong to the same system, and in order to provide personal access to access stations in said system, said access stations in said system being arranged for loading and/or debiting said purse card with an amount of money, the method being characterized by the step of maintaining a plurality of user groups that are allowed to use said system by using a float ID that is characteristic for each user group for uniquely associating each money flow effectuated by a person throughout said system with a respective user group.
2. The method of claim 1 in which for each load or debit process, or for accumulated process data from previous load and debit processes, a data set is generated which comprises said float ID.
3. The method of claim 1 in which a data set is generated which comprises said float ID and a currency ID.
4. The method of claim 1 in which the float ID is used to separately track the money flows associated with said float ID throughout said purse system, from the purse card up to a purse provider's accounting system.
5. An electronic purse system arranged for performing the method of claim 1.
6. An electronic data carrier for personal use in the system and arranged for performing the steps of the method of claim 1.
7. A computer program comprising code portions adapted for performing the steps of the method of claim 1 when said program is loaded into a secure access module.

CURRENCY AND FLOAT ID TRACKING IN AN ELECTRONIC PURSE

ABSTRACT

5 The present invention relates to electronic purse systems, and in particular it relates to the improved management of multiple money flows in such systems. According to the basic principles of the present invention it is proposed that the secure access modules (SAMs) of a purse provider support multiple user groups or environments in the system while still requiring only one system key. The user groups or environments are identified by a so-called float ID tag
10 which is advantageously added to each set of data involved in a load or purchase process performed by the user of the electronic purse system.

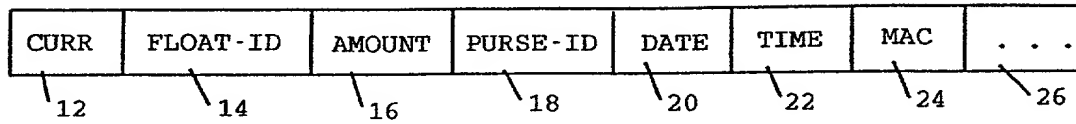


FIG. 1

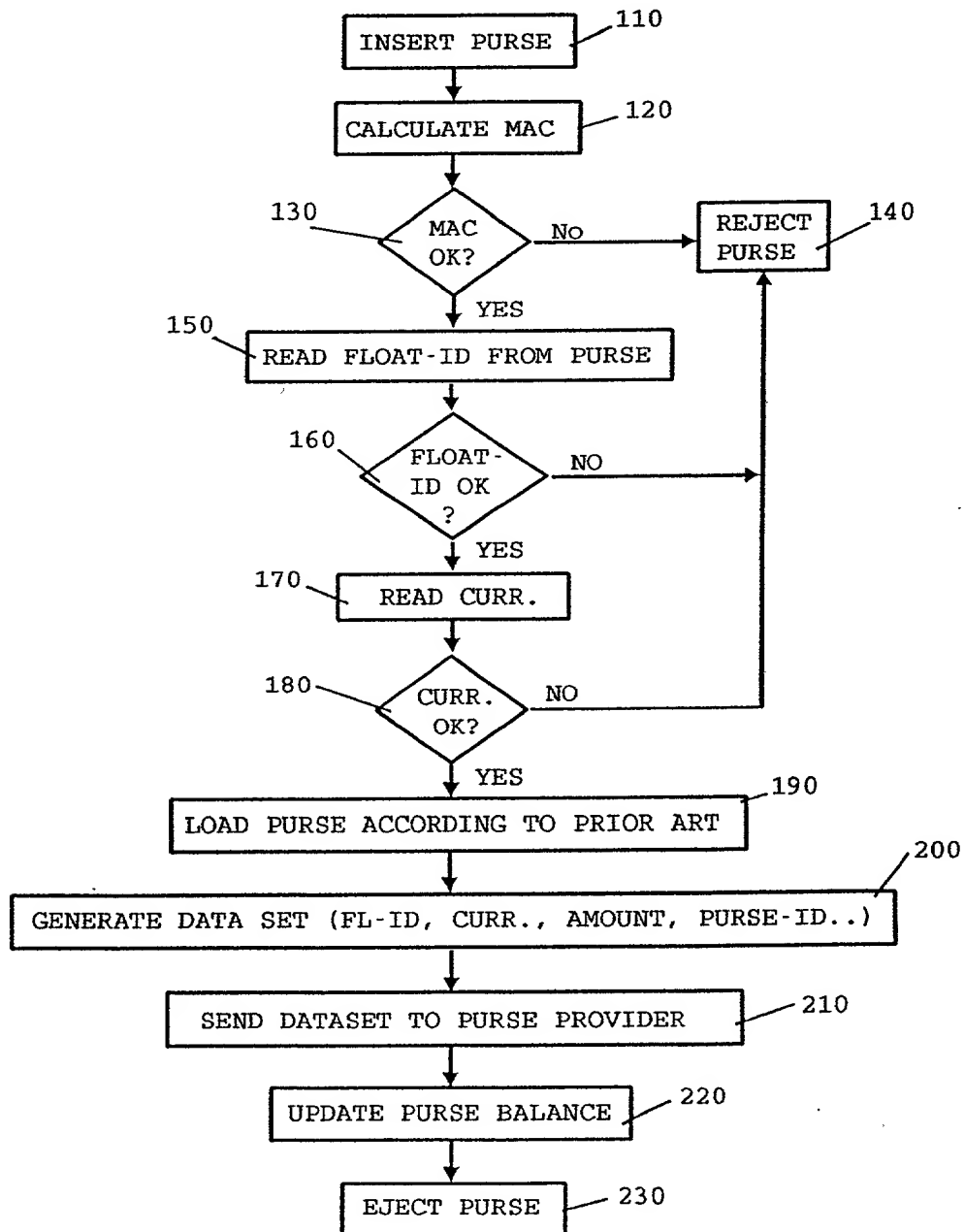


FIG. 2

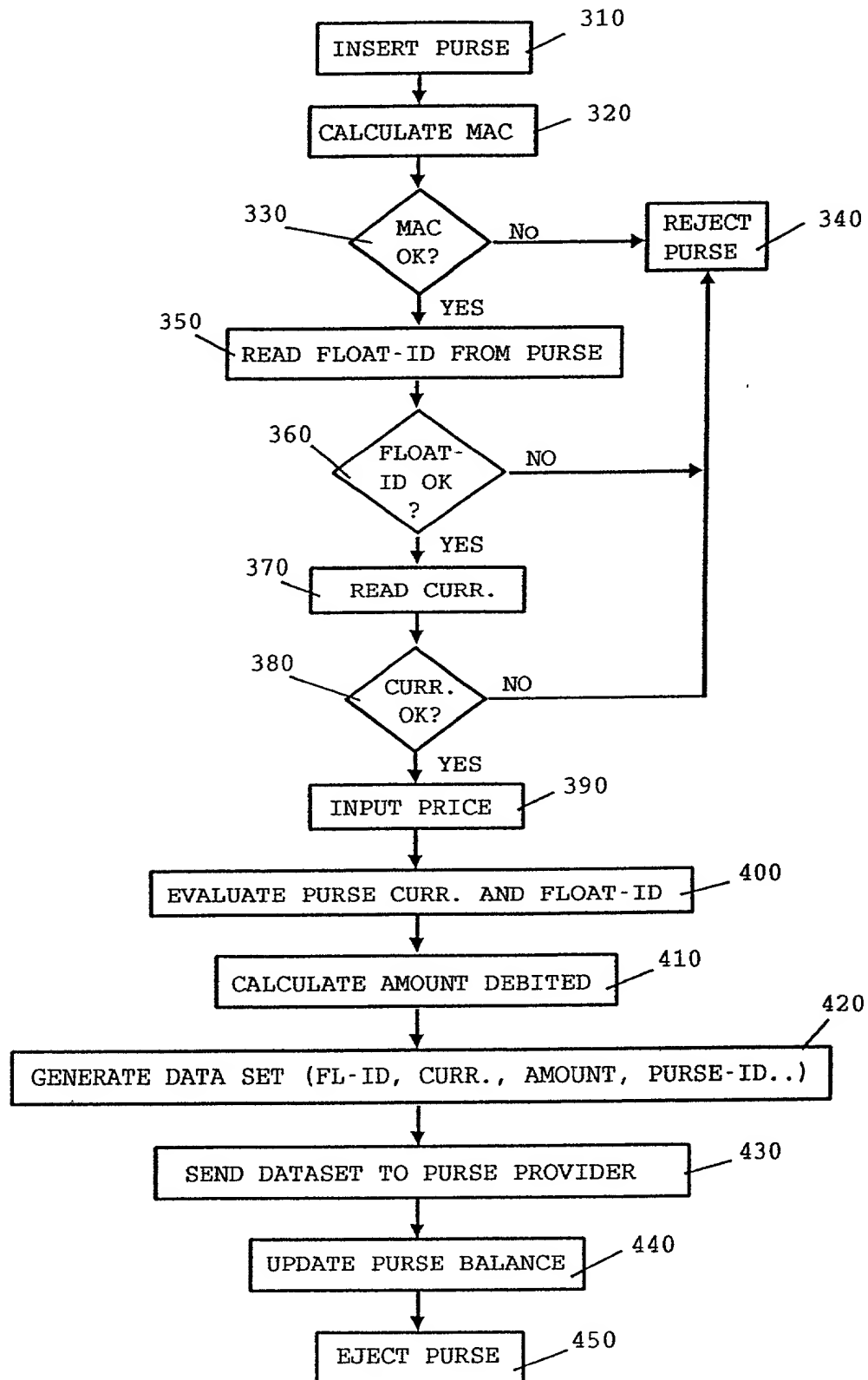


FIG. 3

Docket No.
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Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
Currency and Float ID Tracking in an Electronic Purse

(the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International
Application Number _____
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

99122520.2	Germany	12/11/1999	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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Citizenship German	
Post Office Address Same As Residence	

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Citizenship German	
Post Office Address Same As Residence	